



# 2011 FLOOD FACTS

CRS Activity 330

## Interactive Locator Map



Click [here](#) to view an interactive map and zoom in on any area in the county to see structures, projects and studies.

- [Map Instructions](#)

To access information on Flood Control projects, structures, and studies use the Flood Control District's "Interactive Map" by going to the "Projects & Structures" page on District web page at:

[www.fcd.maricopa.gov/Projects/PPM/projStruct.aspx](http://www.fcd.maricopa.gov/Projects/PPM/projStruct.aspx)



In 2010 severe storms and flooding disasters in Rhode Island, Tennessee, South Dakota, Illinois and many other states cost millions of dollars. Many conditions can result in a flood: hurricanes, broken levees, outdated or clogged drainage systems and rapid accumulation of rainfall.

Learn your flood risk. Just because you have not experienced a flood in the past does not mean you will not in the future. Flood risk is not just based on history; it's also based on a number of factors: rainfall, river-flow, topography, flood-control measures, and changes due to building and development. Remember, anywhere it rains it could flood.

Find out your relative flood risk by contacting the Flood Control District of Maricopa County at [www.fcd.maricopa.gov](http://www.fcd.maricopa.gov) or (602) 506-1501, go to [www.FloodSmart.gov](http://www.FloodSmart.gov), or contact your insurance agent.



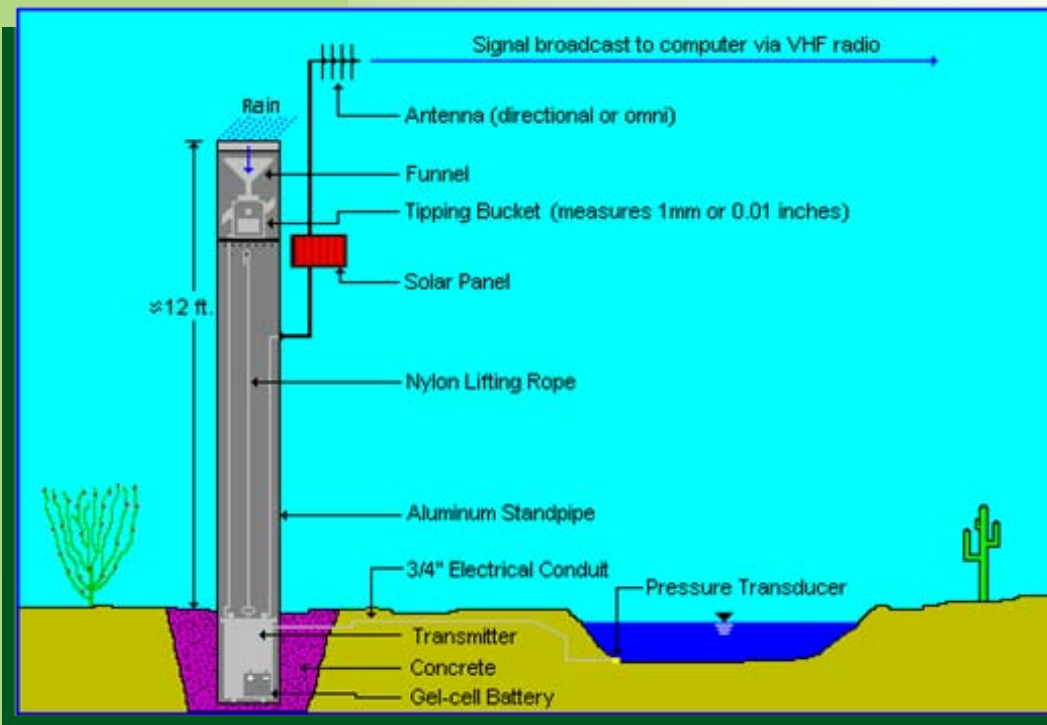
\*Cover photos of Nashville, Tennessee  
5/4/2010 - FEMA

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# FLOOD WARNING SYSTEM



The Flood Control District of Maricopa County (District) operates a 24-hour rain, stream, and weather gage network known as the ALERT system. The system provides real-time information to the County and many other agencies about rainfall, floods, and weather conditions in Maricopa County.

ALERT is an acronym for Automated Local Evaluation in Real Time and was developed by the National Weather Service in the late 1970s. An ALERT station may contain several gages or sensors at a single location to measure different environmental parameters.

The information provided by the ALERT system is important to the Flood Control District because occasional heavy rainfall can generate stream flows which significantly impact flood control facilities such as dams and channels. Each gage is programmed with an alarm setting. When measurements reach a certain threshold an alarm sounds and sets the following in motion:

- An on-call hydrologist evaluates and monitors the situation.
- Flood warnings are provided to the District observation teams, other County departments, city emergency management departments and the National Weather Service.
- The National Weather Service issues public flood warnings and other weather advisories.
- Emergencies are declared by the Maricopa County Department of Emergency Management.

The District started installing ALERT stations in 1980 after the late-1970s floods. Gages were first placed to monitor the major rivers, and then later installed on District dams and flood control structures. After the 1993 floods, the District started placing more gages in smaller washes and upstream of unbridged road crossings. In addition to operating the ALERT system, the District also provides information for several local Flood Warning Plans, and provides information to the Maricopa County Department of Transportation Flooded Roadway Response Program.

The ALERT system data is also valuable after a storm. The stored data is used to reconstruct storm events in order to show the origin of flooding problems and to provide data for use in floodplain studies, computer modeling of watersheds and design of future flood control structures.



The gages transmit their information via VHF radio and are powered by 12-volt batteries, which are recharged by small solar panels attached to the gage. A central computer evaluates the data and can sound preset alarms. The typical ALERT system is made up of rain, stream, and weather gages spaced throughout a watershed. Currently, the District has 304 automatic rain gages, 167 automatic stream gages and 33 automatic weather stations throughout Maricopa and neighboring counties

### **Natural & Beneficial Functions**

Floodplains are crucial for maintaining natural flood and erosion control.

## **DRAINAGE SYSTEM MAINTENANCE**



Maricopa County has Drainage Regulations that apply throughout the unincorporated areas of the County. These Regulations are administered and enforced by the County's Planning and Development Department, which prohibits the placement of any fill material, rubbish, trash, weeds, filth or debris, which obstructs, retards or diverts any natural or improved drainage system upon any private or public property located in unincorporated Maricopa County.

On April 18, 2007, the Maricopa County Board of Supervisors adopted the Drainage Policies and Standards Manual, which apply to all unincorporated areas of the county. The intent of this manual is to provide guidance and detail on implementation of the Floodplain Regulations for the Flood Control District and the County's Drainage Regulations. For information regarding the drainage regulations or inquiries regarding drainage maintenance, go to [www.maricopa.gov/planning](http://www.maricopa.gov/planning) or call (602) 506-3301.



Part of the District's commitment is to plan and design flood control facilities as "places for people", that provide open space opportunities year round. Floodplain benefits include the following:

- Provide flood storage and conveyance, reduce flood velocity, and controls erosion.
- Filter nutrients and impurities from runoff for drinking and wildlife.
- Support a high rate of plant growth, provide breeding and feed grounds for wildlife and enhance waterfowl habitat.
- Allow for scientific study and environmental research.



## HISTORIC FLOOD FACT - YEAR 1978

### **Substantial Damage and Improvement**

The District and local communities participate in the National Flood Insurance Program (NFIP) by adopting and enforcing regulations and codes that apply to development in Special Flood Hazard Areas (SFHAs).

- A substantial improvement means the cost to rebuild/improve a structure in the floodplain, **whether damaged or not equals more than 50% of market VALUE PRIOR TO WORK START.**



- Substantial damage means the cost of post-damage repair equals **more than 50% PRE-DAMAGE MARKET VALUE.**

The Floodplain Regulations for Maricopa County require the property owner to obtain a Floodplain Use Permit for improvements, modifications, reconstruction, repair or additions to existing buildings. Regulation compliance is required when improvements, modifications, additions, reconstruction or repairs reach the 50% Substantial Improvement threshold per the Floodplain Regulations.

**March:** Warm temperatures accompanied by heavy rain filled reservoirs behind all the dams on the Salt and Verde Rivers forcing the largest flow (149,000 cubic feet per second) of water down the Salt since 1891. The released water overflowed the channel and flooded residential areas and farmlands. During the same period, storm fronts passing over the state caused flash flooding and destruction. Homes were damaged and destroyed. Estimated damage - \$37 million.



19th Avenue Bridge & Salt River

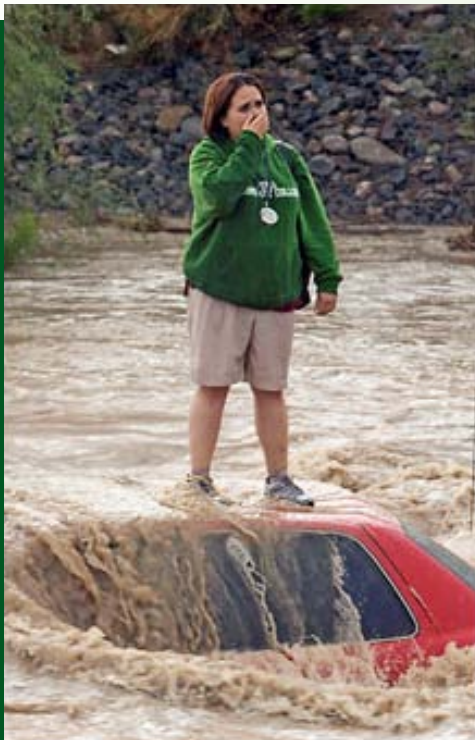
**November and December:** Floodwaters virtually destroyed the community of Allenville near Buckeye and caused heavy damage in Holly Acres on the Gila River and Hound Dog Acres on the Agua Fria River. Both bridges on Interstate 17 at Black Canyon City collapsed. Duncan, on the Gila River experienced a flood when a dike broke and water gushed through the town. Estimated damage - \$51.8 million



Goodyear - Agua Fria River & Gila River



# FLOOD SAFETY



New residents in Maricopa County are often surprised to learn the region's desert environment is conducive to flash flooding. A flash flood is a torrent of water rushing through a normally dry or low-flow creek, stream, wash, ravine and culvert, or through other low-lying areas.

During a rainstorm, normally dry waterways can quickly become raging rivers due to water running off mountains and higher elevations onto the flat terrain below. Remembering the following safety facts could save your life:

- Stay Out of Flooded Washes, Rivers and Streams. The rushing water of a flash flood collects soil and debris as it moves along and destroys everything in its path.
- Six inches of water can sweep a person off their feet.
- Two feet of water will cause many vehicles to float.
- Nearly half of all flash flood-related fatalities involve motorists.
- If you live in a frequently flooded area, stockpile emergency building materials, such as plywood, plastic sheeting, lumber, nails, hammer and saw, shovels and sandbags.
- Make sure everyone knows how and when to turn off gas, electricity and water.

## **FLASH FLOOD WARNING**

The National Weather Service will issue a flash flood warning if flash flooding has been reported or is imminent. **YOU MAY HAVE ONLY SECONDS!**

## **FLASH FLOOD WATCH**

The National Weather Service will issue a flash flood watch when flash flooding is possible within a designated area.



## **Flood Insurance**

An average flood insurance policy costs approximately \$600 a year for the structure and contents. Depending on the area and how much coverage is desired, a policy(s) at a lower cost is available.

Maricopa County participates in the FEMA sponsored National Flood Insurance Program (NFIP) through the Community Rating System (CRS). Under the CRS, flood insurance premiums are lower for communities that work to reduce flood damage, manage development, and protect structures beyond the minimum requirements of the NFIP.

Currently Maricopa County has a Class 4 rating, which is a 30% discount in flood insurance to property owners within the SFHA in the unincorporated county.

- Flood damage is not covered by your standard homeowners or business insurance. You need a separate flood insurance policy.
- Separate policy is required to insure your contents due to flooding.
- The National Flood Insurance Program (NFIP) provides federally backed flood insurance to communities that enact and enforce floodplain regulations and participate in the NFIP.
- There is a 30-day waiting period before flood insurance takes effect.








**To find a local flood insurance agent or to estimate your premium call the NFIP at 1-888-379-9531 or go to [www.floodsmart.gov](http://www.floodsmart.gov).**



### Additional Sources

1. For flood insurance assistance visit the National Flood Insurance Program (NFIP) at [www.floodsmart.gov/floodsmart](http://www.floodsmart.gov/floodsmart).
2. For more mapping/insurance/regulation information visit the Flood Control District of Maricopa County at [www.fcd.maricopa.gov](http://www.fcd.maricopa.gov) under Floodplain Management.
3. The Federal Emergency Management Agency (FEMA) is charged with building and supporting the nation's emergency management system. Visit [www.fema.gov](http://www.fema.gov) for more information on flooding and disasters.

### Floodplains of Maricopa County

-  Floodplains
-  Lakes
-  Communities
-  Other Counties
-  Maricopa County
-  Highway
-  Major Roads



5 2.5 0 5 Miles

The Flood Control District of Maricopa County conducts floodplain management for the unincorporated areas of Maricopa County and the 13 incorporated communities listed below:

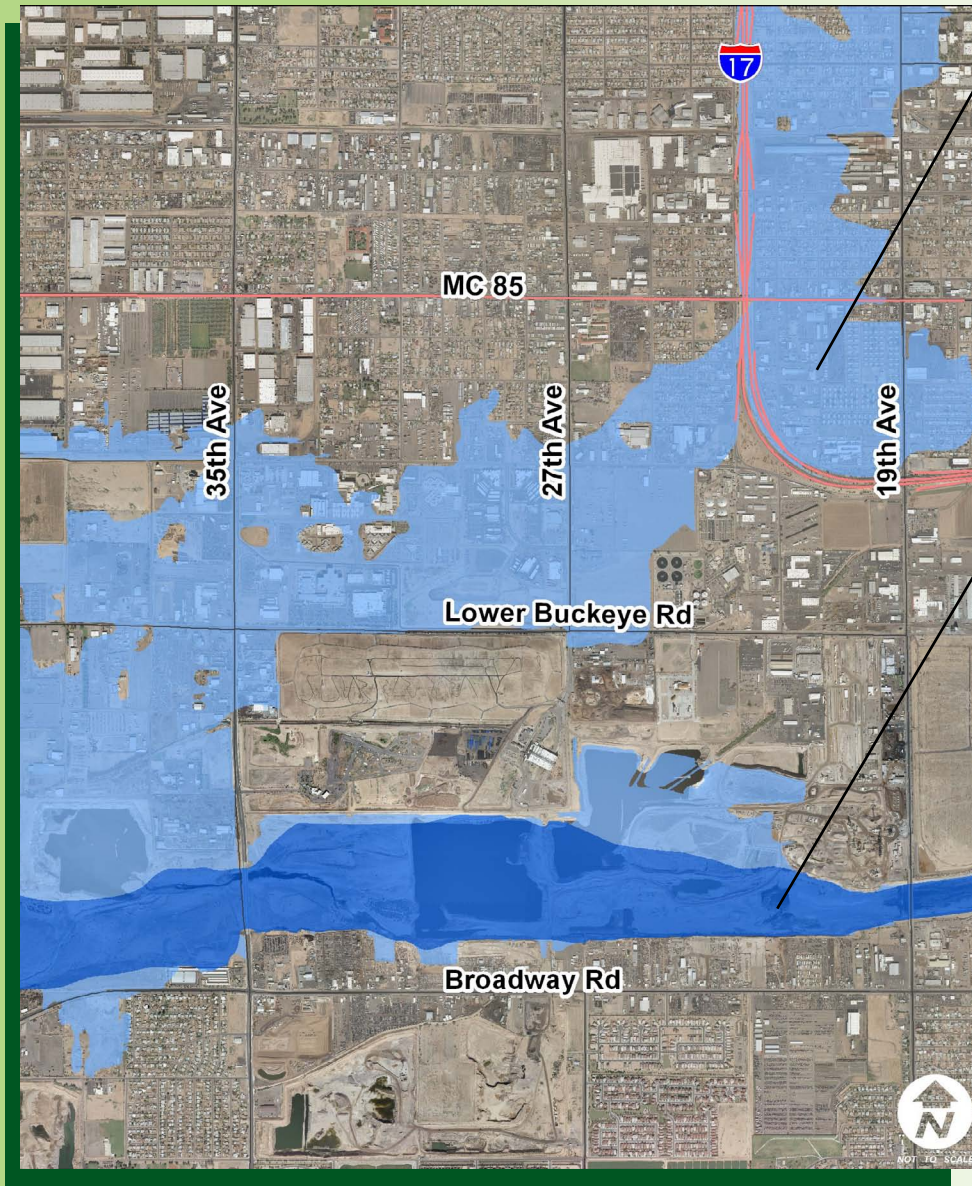
Buckeye	Guadalupe
Carefree	Litchfield Park
Cave Creek	Mesa
Chandler	Queen Creek
El Mirage	Surprise
Gila Bend	Tolleson
	Youngtown

Produced by Maricopa County  
Public Works GIS Division  
July 2011



# LOCAL FLOOD HAZARD/RISK

To better understand how local flood hazards and risk are identified, begin by asking these questions:



## What is a Floodplain?

This is the area adjoining a drainage way that is subject to inundation by a base flood.

## What is a Base Flood?

This is inundation during periods of higher than normal stream flow that has 1% chance of being equaled or exceeded in any given year. This area is commonly referred to as the 100-year floodplain.

## What is a Floodway?

This is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without increasing the base water surface elevation more than 2 feet.

## What is a Special Flood Hazard Area (SFHA)?

The Special Flood Hazard Area (SFHA) is the land area (designated by Zones) covered by the floodwaters of the base flood. The SFHA is the area where floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies.

To identify a community's **flood risk** the Federal Emergency Management Agency (FEMA) conducts a Flood Insurance Study (FIS), which is a report that summarizes the analyses of flood hazards in a community by using hydrologic/hydraulic analysis, 1% annual chance flood event, **Base Flood Elevation (BFE)**, designated **floodways**, risk **zones**, river flow, rainfall and topographic surveys. The analyses and flood history used to prepare the FIS are also used to prepare the Flood Insurance Rate Map (FIRM), which is a map that shows the flood hazard areas in a community.

The FIRM is the basis for floodplain management, flood hazard mitigation, and insurance activities in the National Flood Insurance Program (NFIP). The FIRM is the official map of a community on which FEMA has delineated both the **special hazard areas** and the risk premium **zones** applicable to the community.

The Federal Emergency Management Agency (FEMA) is in the process of updating the FIRMs. The current maps are from 1985 and over the years, many of the flood insurance maps have become outdated due to urban growth, changes in river flows and flood mitigation efforts. Accurate **flood risk information** is essential to inform property owners of **changing flood risks** and to determine appropriate rates for flood insurance coverage.



Community officials use the FIRM to administer floodplain management regulations and to mitigate flood damage. Lending institutions and federal agencies use the FIRM to locate properties and buildings in relation to **mapped flood hazards**, and to determine whether flood insurance is required when making loans or providing grants for the purchase or construction of a building following a disaster.

It is important for the Flood Control District (District) to have accurate up-to-date information that **identifies flood hazards** throughout Maricopa County. The District accomplishes this goal by doing Floodplain Delineation Studies that identify land areas (floodplains) subject to inundation by a flood that has a 1% probability of being equaled or exceeded in any given year, also known as a 100-year flood. The results of a Floodplain Delineation Study are submitted to FEMA in order for the study to be incorporated onto the FIRM. Any development in an area that is determined to be in a floodplain must meet the requirements of local, state and federal regulations.

There are many areas of the County that have not been studied yet and the **flooding hazards** for these areas aren't known. Your area may not have been studied yet, or the floodplain limits might be modified because of changes that occurred during flooding events, or due to development in the area. To help you make informed decisions about protecting your property both financially and structurally see the following websites for help:

Federal Emergency Management Agency  
Flood Control District of Maricopa County  
Local Community Building Official

[www.floodsmart.gov](http://www.floodsmart.gov)  
[www.fcd.maricopa.gov](http://www.fcd.maricopa.gov)  
[Your City Website](#)

### **Floodplain Regulations**

The Flood Control District of Maricopa County Board of Directors has adopted and enforced the Floodplain Regulations since February 25, 1976. The Floodplain Regulations for Maricopa County define the rules for usage, development restrictions and permitting requirements necessary to protect the environmental and flood control qualities of floodplains.

- Prevent or regulate construction in the Special Flood Hazard Areas (SFHA) which will divert floodwaters or may increase flood hazards in other areas.
- Protect the natural and beneficial function of the floodplain and the life, health, and property of County residents.
- Minimize expenditures of public money for flood control projects.
- Control the alteration of natural floodplain and watercourses.

The Floodplain Regulations require the property owner to obtain a Floodplain Use Permit to build, improve, modify, reconstruct, repair, or add to existing buildings. For more information go to [www.fcd.maricopa.gov/Permitting](http://www.fcd.maricopa.gov/Permitting) or call (602) 506-1501.



## PROPERTY PROTECTION

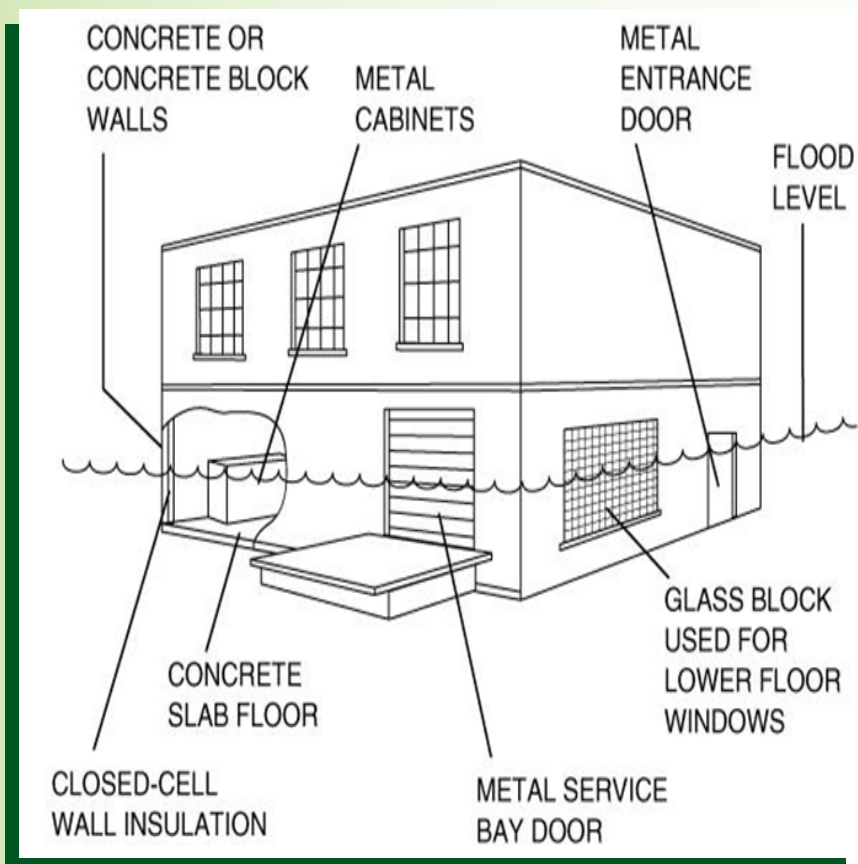


Floods cause an average \$5 billion in losses and 100 fatalities yearly. About 3,800 towns are on floodplains. Don't be lulled into a false sense of security by the term "100-year flood." That doesn't indicate that a flood will occur only once a century.

Instead, "100-year flood" means that every year, there's a one-in-100 chance of that level of flooding. If you live in a flood zone, the U.S. Geological Survey estimates that you have a one-in-two chance of experiencing a flood in your lifetime.

The following are some measures you can take to protect yourself, your home, or your business from losses:

- Elevate your structure, main breaker/fuse box, utilities and meter
- Buy flood and contents insurance
- Build with flood damage resistant materials
- Dry floodproof your structure
- Anchor fuel tanks
- Install sewer backflow valves
- Protect wells from contamination by flooding
- Be prepared and ready to evacuate your home and take refuge in public shelters and know how to care for their basic medical needs.
- Construct natural barriers/berm landscape by grading correctly to improve drainage



Floodproofing buildings can help reduce the potential for flood damages to the structure and contents. Most communities have building codes and ordinances to guide construction practices. Many of these are designed to mitigate your risks from all types of hazards including floods. Building materials are considered flood resistant if they can withstand direct contact with flood waters for at least 72 hours without being significantly damaged.

**FOR ANY MEASURE(S) YOU SELECT, MAKE SURE TO ACQUIRE THE CORRECT PERMITS.**

“Significant damage” means any damage that requires more than low cost, cosmetic repair. Flood damage resistant materials should be used for walls, floors, and other parts of a structure that are below the base flood elevation (BFE). Different floodproofing techniques are appropriate for different types of structures and flood hazards. **If you have questions about mitigation effort to your home or business, contact a professional or your community building official. Other sources of information available are as follows:**

Federal Emergency Management Agency (FEMA)	<a href="http://www.fema.gov">www.fema.gov</a>
Flood Control District of Maricopa County	<a href="http://www.fcd.maricopa.gov">www.fcd.maricopa.gov</a>
Maricopa County Planning & Development	<a href="http://www.maricopa.gov/planning">www.maricopa.gov/planning</a>
Local Community Building Officials:	<a href="#">Your City Website</a>
Local Library:	<a href="#">City or County</a>

## FLOODPLAIN DEVELOPMENT & PERMIT REQUIREMENTS



The permit requirement aims to minimize flood damage potential to your property without increasing the flood risk to your neighbors' property.

If your property is located within a floodplain and you want to make changes to land located within a 100-year flood hazard area, local regulations require you to obtain a Floodplain Use Permit before you build, add, grade, or install walls or fencing.

Before issuing a floodplain use permit, the District undertakes a detailed review of the hydrologic conditions that affect the property and checks to make sure that any proposed improvements conform with the County's **Floodplain Regulations**. To review the Floodplain Regulations go to [www.fcd.maricopa.gov](http://www.fcd.maricopa.gov).

Use the map locator found at [www.fcd.maricopa.gov/GIS/maps.aspx](http://www.fcd.maricopa.gov/GIS/maps.aspx) and search by the following:

1. Assessor's Parcel Number
2. Address Street Intersection
3. Township/Range

This web page is designed to give you an idea if your property is in a floodplain or not. It **is not** an official document that can be used for floodplain determination. Current studies, erosion setbacks and other factors may also affect the floodplain status of the property. To get an official floodplain determination, call the Flood Control District of Maricopa County at (602) 506-1501.



**DO NOT ENTER  
FLOODED WASHES**

# FOR ADDITIONAL INFORMATION

**WHEN FLOODS  
ARE NEAR,  
STEER CLEAR**

**See the following websites:**

Arizona Flood Warning System:

[www.afws.org](http://www.afws.org)

Flood Control District of Maricopa County:

[www.fcd.maricopa.gov](http://www.fcd.maricopa.gov)

Maricopa County Emergency Management:

[www.maricopa.gov/emerg\\_mgt](http://www.maricopa.gov/emerg_mgt)

National Weather Service:

[www.nws.noaa.gov](http://www.nws.noaa.gov)

For Flood Watch/Warnings and Flash Flood Watch/Warnings tune into local stations (TV or radio) or the local NOAA Weather Radio in the Phoenix area - KEC 94 at 162.550

If this brochure was mailed to you, chances are your property is in a flood hazard zone and you are required to carry flood insurance. This brochure is designed to provide you with general information to get you started in your flood protection measures.

**Flood Control District  
of Maricopa County**

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Phoenix, Arizona 85009  
Phone: 602-506-1501  
Fax: 602-506-4601  
[www.fcd.maricopa.gov](http://www.fcd.maricopa.gov)

